Racial and Sex Disparities in the Detection of Coronary Artery Disease by CT Imaging

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Aims

- Discuss the results of novel research on the use of coronary CTA in understanding racial and sex differences in the evolution of coronary artery disease.
- Understand how new CT techniques allow clear visualization of patterns of plaque evolution and calcification in different races and sexes.
- Recognize that certain coronary lesions and markers are more easily detected, thus "biasing" certain risk estimates.
- Recognize that variances in coronary artery disease treatment amongst different patient populations contribute to health disparities.

Background

- Cardiovascular disease (CAD) is a leading cause of death for both men and women in the United States.
- Numerous resources have been dedicated towards the study and improvement of tools with which to diagnose and treat the coronary artery disease.
- We reviewed literature from around the world to analyze differences in the disease’s pathology across different demographics, taking note of how changes impact its detection based on race and sex.

Methods

- Utilized the MESA Study to compare differences in risk factor influence.
- Investigated the literature to determine why certain plaques are more easily detected, thus "biasing" risk estimates derived from CT imaging.
- Reviewed the results of novel research on the use of coronary CTA in understanding racial and sex differences in the evolution of coronary artery disease.

Results

- Plaque Analysis in Patients with Acute Chest Pain via Coronary CT Angiography
  - African American Patients (n = 150)
  - White Patients (n = 151)

<table>
<thead>
<tr>
<th>Plaque Analysis</th>
<th>African American</th>
<th>White Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any Plaque</td>
<td>118</td>
<td>111</td>
</tr>
<tr>
<td>Coronary Stones &lt; 50%</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Calcified Plaque</td>
<td>39</td>
<td>53</td>
</tr>
<tr>
<td>Mixed Plaque</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>Noncalcified Plaque</td>
<td>96</td>
<td>62</td>
</tr>
</tbody>
</table>

The greater prevalence of non-calcified plaques, which have been proven to be more unstable, correlates with other studies that have revealed increased cardiovascular incidence in African Americans, despite similarities in overall plaque burden and stenosis in whites (95% CI=1.52-4.04; p < 0.001).1

- Comparison of Revascularization among Races
  - Black
  - White

Despite similar rates of diseased vessels, African Americans were less likely to receive coronary revascularization compared to whites, and even after adjusting for various baseline clinical factors, black patients remained less likely to undergo coronary revascularization (95% CI=1.60-4.04; p < 0.0001).2

Conclusions

- Several pathological differences exist when it comes to CAD detection in various demographics.
- These variances have led to changes in how the clinical course of cardiovascular disease affects each demographic and have played a role in the development of health disparities.
- Understanding and acknowledging these differences will allow for better detection across all racial groups for both men and women alike.

Outline of Future Manuscript

- Structured summary and review of the world literature on the use of coronary CTA in different races and sexes.
- Review the presentation of subclinical atherosclerosis in various races and sexes.
- Review how disparities in detection arise from differences in coronary lesions.
- Analysis of care and surgical follow up in diverse populations.

References